NOTES AND EXTRACTS.

NITROGEN IN RAIN WATER.

Meteorologists generally consider that they have done their duty by the rainfall when they measure the quantity and the time of occurrence, either daily or hourly. But the students of agriculture and forestry, those who drink rain water, and those who study the physics of the atmosphere are all alike interested in the chemical composition of the rain water. The time must come when chemical analysis of the rain water will be made systematically at a large number of carefully selected rainfall stations. It is hardly desirable that any of these should be located in large cities, since the rain that falls there has so little influence on agriculture or water supply. The most important stations will be those in the open country, whether inland or near the seacoast, and especially those at mountain tops and base stations. The importance of this subject to agriculture may be estimated from a statement by Mr. H. Ingle, in charge of the chemical work of the Department of Agriculture of the government of the Transvaal. According to "Nature", Mr. Ingle finds that Transvaal soils are deficient in nitrogen, but that the receipt of combined nitrogen from the atmosphere, namely, nitrates, ammonia, etc., is much larger than in England. Thus, at Rothamsted the average annual receipt of atmospheric nitrogen in the rain water amounts to 4.75 pounds annually, whereas in February and March, 1904, in Pretoria, the rainfall brought down about two pounds per acre. As the normal rainfall for these two months is seven inches, while the annual rainfall is thirty inches, it may, therefore, be estimated that the annual quantity of nitrogen brought down by the rain at Pretoria is at least eight and possibly ten pounds per acre, or twice as much as received at Rothamsted in England.

By analogy we may anticipate that the varying proportions of nitrogen brought down in different portions of the United States by the rainfall may be an important consideration in explaining the agricultural peculiarities of special regions.—C. A.

THE VAPOR PRESSURE OF MERCURY.

The measurement of atmospheric pressure by means of the mercurial barometer is subject to a slight additive correction, by reason of the fact that the vacuum chamber is filled with the vapor of mercury pressing down on the column and making the atmospheric pressure appear smaller than it actually is.

Professor Morley has recently published the results of a series of determinations of the vapor pressure of mercury at temperatures between 0° and 100°.[1] The results previously given are, as he points out, based mainly upon interpolated or extrapolated values and are widely discordant. Professor Morley's method consists in passing a pure and dry inert gas, either carbon dioxide or hydrogen, through a weighed quantity of mercury contained in Winkler absorption tubes, the current of gas being so slow and contact with the metal so thorough that the gas becomes perfectly saturated with the vapor of mercury. The volume of the gas is measured, and gives, when reduced to the temperature of the mercury, the volume of the saturated vapor. The loss of weight of the mercury in the absorption tubes gives the weight of this saturated vapor, and from these data the pressure of the vapor may be computed.

In one series of experiments, each of which continued for about two weeks, the mercury was kept in a room whose nearly constant temperature was measured by a thermograph. In another case the mercury was immersed in a water bath maintained at constant temperature.

[1] On the vapor pressure of mercury at ordinary temperatures. London, Edinburgh, and Dublin Philosophical Magazine, June, 1904, pp. 662–67.

The following table indicates the method of calculation and gives the results.

The last column is computed by the formula—

$p = ab^t$, in which log a = 4.6064 and log b = 0.02856.

Vapor pressure of mercury.

Temperature.	Weight of 1 liter of mercury vapor.	Weight of 1 liter of mercury vapor at 1 mm.	Vapor pressure observed.	Vapor pressure computed.
°C.	Milligram.	Milligrams.	Millimeter.	Millimeter.
0				0.0004
10				0.0008
16			0.0010	0.0012
20				0.0015
30	0.028	10.60	0.0027	0.003
40	0.054	10.26	0.0052	0.006
50	0.112	9.94	0.0113	0.011
60	0.206	9.65	0.0214	0.021
70	0.378	9.37	0.0404	0.040

These results agree well with those computed by Hertz from 0° to 50°. They are about one-tenth as large as the values found at 0° and 10° by van der Plaats, who used a similar but somewhat less simple method. Professor Morley states that his own values "have now been found the same in experiments made in three different years and with many modifications of apparatus."—F. O. S.

WEATHER BUREAU MEN AS INSTRUCTORS.

Prof. H. J. Cox, Chicago, Ill., reports that classes from the schools named below visited the local office of the Weather Bureau during 1904 and were given instruction in the work of the Bureau by some one of the assistants on duty at the station.

February 27 and March 5, Mayfair High School.
March 7 and 8, Austin High School.
March 18, 21, 22, and 23, West Division High School.
April 7, Austin High School.
April 15, West Division High School.
April 28, Young Men's Christian Association Institute.
July 28, John Spry Vacation School.
October 21, Austin High School.
December 8 and 10, University of Chicago.
December 10, Morgan Park High School.

Mr. Charles Stewart, Observer, Spokane, Wash., lectured at the local office on December 9 to the 45 pupils constituting the physical geography class of the Spokane High School on meteorology and the work of the Bureau. Forecasting was touched upon, and the fallacy of long-range forecasts and the moon's influence on the weather were discussed.

Mr. George A. Loveland, Section Director, Lincoln, Nebr., on December 28 spoke briefly before the "Teachers of Science" section of the Nebraska State Teachers Association on the subject of meteorology in the public schools. Mr. Loveland was subsequently elected secretary of the section, of which he has been a member for many years in virtue of his position as instructor in the University of Nebraska.

Mr. Clarence J. Root, Assistant Observer at Charles City, Iowa, reports that on December 10 the office was visited by the superintendent of schools and the seven teachers of the Charles City High School. The instruments were explained and the work of the Bureau and the movement of storm areas discussed.